

## Vessel Inspection Program

# Environmental Health Manual



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# Preface

Over more than two decades, the South Eastern Sydney Public Health Unit, which holds jurisdiction over the Port of Sydney for the administration of New South Wales public health legislation, has worked to ensure the health and well-being of international and domestic cruise passengers and crew.

The Public Health Unit has a multi-faceted program in relation to vessels. It maintains a cruise ship health surveillance program which includes responsibility for supporting the public health response to any public health risk detected on cruise vessels in NSW; and coordinates an environmental health cruise vessel inspection program.

The aim of the NSW Health Vessel Inspection Program is to ensure sanitation practices on board cruise ships meet local standards, reflecting the intent of the International Health Regulations. By a planned process of environmental health inspection and reporting, the Program reduces the likelihood of the introduction and spread of human disease.

The focus of Vessel Inspection Program activities is on cruise ships, as the size of the complement - often numbering thousands of passengers and crew - increases health risks and opportunities for spread of infectious diseases. Portions of this manual may, however, be applicable to other ships.

In early 2020, cruise ships were identified as a source of introduction of SARS-CoV-2 into countries. On 20 March 2020 the spread of COVID-19 globally led to the closure of Australian borders to all non-Australian residents. Additionally, cruise ship journeys to and around Australia were ceased. In June 2022, commercial cruising in NSW recommenced with the Pacific Explorer undertaking a 3-day voyage. The recommencement of commercial cruising has led to the reactivation of the NSW Health Vessel Inspection Program. There are 197 cruises visiting NSW ports during the 2022 – 2023 season.

South Eastern Sydney Public Health Unit intends to continue to build on long-established partnerships with the cruise ship industry, the Australian Department of Agriculture Fisheries and Forestry, the Port Authority of New South Wales and other maritime agencies, supported by Health Protection NSW and other NSW public health units to maintain a strong focus on the protection of health of cruise ship passengers and crew.

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# Introduction

This Manual, produced by the Public Health Unit of South Eastern Sydney Local Health District, on behalf of NSW Health, describes the procedure for conducting and reporting **environmental health inspections** on board vessels that berth in NSW ports.

The aims of the Manual are to provide information on:

- How a routine inspection will be conducted
- Risk factors and control measures
- Technical inspection notes

The Vessel Inspection Program consists of an environmental health inspection conducted by qualified environmental health officers employed by NSW Health. The general role of the public health unit is to identify, prevent and minimise public health risks to the community. These risks may be infectious, chemical, or radiological in nature. They may be caused by other humans, by animals and by the inanimate environment.

The aim of the Vessel Inspection Program itself is to provide:

- a consistent approach to undertaking environmental health inspections for vessels berthing in NSW; and
- routine environmental inspections to monitor compliance with relevant legislation and best practice.

Inspections under the Vessel Inspection Program are conducted in accordance with the framework established by the International Health Regulations 2005<sup>1</sup> and the NSW Public Health Act 2010.<sup>2</sup> To allow international consistency in the conduct of inspections, the Vessel Inspection Program has drawn on the World Health Organization's *Guide to ship sanitation*<sup>3</sup> and the United States Centers for Disease Control and Prevention Vessel Sanitation Program (USVSP).<sup>4</sup>

Environmental health has been defined as *“all the physical, chemical and biological factors external to a person, and all the related factors impacting behaviours.”*<sup>5</sup>

In New South Wales, environmental health issues which are subject to state public health legislation include:

- safe drinking water supplies,
- public swimming and spa pools,
- *Legionella* control,
- skin penetration procedures,
- the final arrangements of the deceased.

Other environmental health issues such as food safety, noise, air and water pollution, sewage management, and vector control do not fall under the direct responsibility of NSW Health, but other agencies may seek advice or participation in standards development from NSW Health.

1 WHO (2005) International Health Regulations, <https://www.who.int/publications/i/item/9789241580496> accessed 4 January 2023.

2 Australian Consolidated Acts, Public Health Act 2010, <https://legislation.nsw.gov.au/view/html/inforce/current/act-2010-127> accessed 4 January 2023.

3 WHO (2011) Guide to ship sanitation 3rd Edition, <https://www.who.int/publications/i/item/9789241546690> accessed 4 January 2023.

4 United States Centres for Disease Control and Prevention, Vessel Sanitation Program, <http://www.cdc.gov/nceh/vsp/> accessed 4 January 2023.

5 World Health Organization, 2019, Environmental Health, [https://www.who.int/health-topics/environmental-health#tab=tab\\_1](https://www.who.int/health-topics/environmental-health#tab=tab_1) accessed 4 January 2023.

In particular it should be noted that in New South Wales, food safety is promoted and enforced by the NSW Food Authority, which may be contacted from within Australia on **1300 552 406**. Quarantine and biosecurity at the international border including ballast water management requirements are enforced by the Australian Department of Agriculture, Fisheries and Forestry<sup>6</sup>

The Vessel Inspection Program works in conjunction with the **NSW Cruise Ship Health Surveillance Program**, also led by South Eastern Sydney Public Health Unit. The Cruise Ship Health Surveillance Program is a NSW Health program to facilitate the accurate reporting of respiratory illness and gastroenteritis of public health and quarantine concern, and to promote the early reporting of outbreaks to allow a timely public health response. To date the work of the surveillance program has assisted in developing preventative measures to reduce the spread of infections aboard ships.

#### **When will an inspection be carried out?**

Inspections will be carried out routinely or in the event of an outbreak or other public health issue.

#### **Routine Inspection.**

NSW Health prioritises vessels for routine inspections based on risk. Several public health units including Hunter New England, Illawarra Shoalhaven and South Eastern Sydney, provide environmental health officers to undertake inspections. Prior notification that an inspection is due to occur will be given to either the vessel or their company representatives. A list of required equipment for inspections is included as Appendix A.

#### **Vessel Inspection Program – Selection of Vessels**

The Port Authority of NSW operates cruise terminals and berths along the New South Wales coastline including the Overseas Passenger Terminal, White Bay Cruise Terminal (both in the Port of Sydney), Port of Newcastle, Port Kembla, Yamba and Eden Cruise Wharf. It is responsible for the cruise schedule, which lists berthing dates three years in advance. Vessels are selected for routine inspection in the Vessel Inspection Program based on this schedule<sup>7</sup>.

A decision matrix was developed to assist prioritisation of vessels for inspection based on frequency of visits, local public health capacity of the vessel's company, recency of inspection, size and frequency of outbreaks, and number of complaints to the Public Health Unit.

#### **Scope of the document.**

The Manual aims to cover key aspects of vessel sanitation which are likely to be encountered by NSW Health environmental health officers and their counterparts in other Australian jurisdictions. In addition, it is designed as a resource for ships' crew, port authorities and other stakeholders involved in the shipping industry.

6 Australian Ballast Water Management Requirements – Version 8, <https://www.agriculture.gov.au/biosecurity-trade/aircraft-vessels-military/vessels/marine-pest-biosecurity/ballast/australian-ballast-water-management-requirements> accessed 4 January 2023.

7 Port Authority of New South Wales, Cruise Schedule, <https://www.portauthoritynsw.com.au/cruise/cruise-schedule/> accessed 4 January 2023.

# Environmental Health Inspection Criteria

Routine environmental health inspections will concentrate on the following ten risk areas. Each risk area has assessment criteria and technical inspection notes.

1. Hygiene and hand washing
2. Kids club/childcare facilities
3. Cleaning equipment and linen
4. Medical services and body holding facilities
5. Drinking water
6. Legionella control and plan
7. Recreational water
8. Skin penetration (beauty therapy and associated facilities)
9. Pest control
10. Waste management

Food inspections are not conducted by NSW Health environmental health officers, as the responsibility for safe food in NSW is under the jurisdiction of the NSW Food Authority. If an environmental health officer makes observations that raise food safety concerns, these will be communicated promptly to the NSW Food Authority. A serious concern will be communicated immediately to enable the NSW Food Authority to inspect the vessel on the same day.

The NSW Health environmental health audit process involves inspecting, testing (where appropriate), recording findings and, if necessary, writing a statement describing why an item did not meet the required standard. The order of the inspection is flexible and will depend on the vessel and availability of the crew.

An electronic audit tool has been developed using the iAuditor application (Safety Culture Pty Ltd, Surry Hills, NSW) for use when inspecting vessels. For further information or for a copy of the audit tool, please contact the Public Health Unit.

At the conclusion of the inspection the Captain or their representatives are given verbal advice in relation to the outcome of the inspection.

A final audit report will be submitted by email, within 5 business days, to the ship's Captain and any other designated company representative. If required, a response is to be provided from the ship to the Public Health Unit within an agreed timeframe in the form of a 'corrective action statement'.

# 01 Hygiene and Hand Washing

Hygiene and hand washing are key in preventing outbreaks and the spread of disease on vessels. Due to the importance of maintaining hygienic practices and providing accessible hand washing facilities to passengers and crew, these criteria will be applied to all general crew and passenger areas of the ship and to specific services, including beauty and personal services, childcare facilities, swimming pools and spas, dining areas, waste storage areas and the medical centre including the mortuary.

## Assessment Criteria

- ✓ Evidence that the crew are educated about the importance of hand washing, good hygiene and wearing clean uniforms.
- ✓ Public toilets and hand washing facilities are convenient and accessible.
- ✓ Hand cleanser, single use hand towels, hand sanitising stations, waste receptacles and signs provided.

## Technical Inspection Notes

### **Evidence that crew are educated about the importance of hand washing, good hygiene and wearing clean uniforms.**

While on duty, the crew must practice good personal hygiene, such as wearing clean clothes, refraining from smoking, and covering their mouth and nose when sneezing or coughing. Crew must wash their hands on reporting to work, after each visit to the toilet, after each break and after coughing, sneezing, or handling garbage or other sources of potential contamination of hands. The inspection will involve observations that crew are undertaking appropriate hand washing procedures.

### **Public toilets and hand washing facilities are convenient and accessible.**

Hand washing facilities must:

- be accessible to all crew and passengers when required, clean, and in good repair.
- provide hot and cold running water from a single mixing outlet. Any self-closing, slow-closing, or metering faucet should be designed to provide a flow of water for at least 15 seconds without the need to reactivate the faucet.
- be provided with soap and suitable single use hand towels or air-dryers, and a waste receptacle.

Toilet facilities must:

- be accessible to all crew and passengers when required and clean.
- have a cleaning schedule. The cleaning schedule should be accessible for review by inspectors and provide details about the last time the facilities were cleaned.
- ensure passengers and crew are aware of the procedure to register a complaint if the facilities are found to be unclean or unhygienic.

Hand washing signs must be posted over hand washing facilities. Signs should state something to the effect of "WASH HANDS AFTER USING TOILET" in an appropriate language or with pictograms.

### **Hand sanitising stations**

Hand sanitising stations should be located strategically around the vessel to allow use by guests on board. The containers of sanitiser should be checked and refilled on a regular basis.



# 02 ‘Kids Club’/Childcare Facilities

## Assessment Criteria

- ✓ **High contact surfaces are kept clean and sanitised as required.**
- ✓ **Nappy changing facilities are to be kept clean and managed appropriately.**
- ✓ **Childcare and kids club facilities should be kept clean and free from clutter.**
- ✓ **Hand washing signs are situated above change tables and in the toilets.**
- ✓ **Sickness records are kept of children & crew.**
- ✓ **Easy-to-read signs in public areas, within the childcare facility, notifying parents that sick children will be excluded from the centre.**
- ✓ **Only easily cleanable toys are used by the centre.**
- ✓ **Evidence of infectious disease/infection control policies and procedures.**

## Risk Factors and Control Measures

Cruise ships may offer a range of age-appropriate childcare programs to keep children, ranging from infants to primary school-aged children, cared for or active whilst their parents relax. Although there are no specific published reports regarding infectious disease outbreaks in cruise ship childcare facilities, from experience in land-based group childcare settings we know that infections can be easily transmitted at childcare facilities due to the large number of children within an enclosed area, potential contamination of the centre environment including high touch areas with body fluids, and immature hygienic behaviors of very young children. Children using the services may have originated from widely dispersed geographical locations, thus increasing risk of exposure to a novel infectious disease. The Australian guidelines, *Staying healthy in childcare - Preventing infectious diseases in early childhood education and care services*, are useful (and are at present being updated).<sup>8</sup>

## Technical Inspection Notes

Each centre must have an infection control policy which covers the following points:

### **High contact surfaces are kept clean and sanitised as required.**

A mild detergent should be used for general cleaning of surfaces. In particular computer keyboards, gaming controllers and eating/play surfaces should be cleaned daily or more if required.

### **Only easily cleanable toys are used by the centre.**

All toys should be washed in warm water and detergent and dried on a daily basis. Books should be inspected for visible dirt and soiling and regularly wiped with a clean cloth.

<sup>8</sup> NHMRC (2013) *Staying healthy in childcare - Preventing infectious diseases in early childhood education and care services*, 5th Edition, <https://www.nhmrc.gov.au/sites/default/files/documents/reports/clinical%20guidelines/ch55-staying-healthy.pdf> accessed 4 January 2023.

**Nappy changing facilities are to be kept clean and managed appropriately.**

The nappy change table must be impervious, non-absorbent, non-toxic, smooth, durable and easy to clean. Prior to each time a nappy is changed a clean piece of paper should cover the change table. Crew must wear gloves to change nappies. After each nappy change the table should be washed with detergent and warm water. All used nappies must be disposed of into a hands-free lidded lined waste bin that is used only for discarding nappies. A hand washing station should be located as close as possible to allow parents and crew to wash their hands.

**Childcare and kids club facilities should be kept clean and free from clutter.**

Facilities should be maintained in a manner that allows for easy cleaning and access. Waste should be removed as appropriate.

**Hand washing signs are situated above change tables and in the toilets.**

Gastrointestinal infections can be spread by people who show no signs of illness. Hand washing is the most effective way of controlling infection. Both crew and children can transmit infections in childcare centres. It is therefore important that crew wash their hands before: arriving at the centre, handling food, and eating; and after changing nappy, going to the toilet, cleaning up faeces or vomit, or wiping a nose. Children's hands should be washed when they arrive at the centre and before leaving, before eating, after having their nappy changed, after going to the toilet, after playing outside and before leaving the centre.

Hand washing facilities must be accessible to crew, children and others who access the childcare facility and provide hot and cold running water, soap and single use paper towels. Hand washing facilities are to provide water at a temperature not to exceed 43 degrees Celsius during use.

In accordance with the WHO *Guide to ship sanitation*,<sup>9</sup> it is useful to encourage hygienic behaviour among passengers and crew by placing a sign above hand washing facilities in bathrooms in the childcare centre advising users to "WASH HANDS AFTER USING TOILET AND CHANGING NAPPIES" or something to this effect.

**Sickness records are kept of children & crew.**

A record of illness must be maintained and held in the childcare or medical centre. The record should include as a minimum: name, age, cabin number, symptoms, onset date and time and any comments relating to notification and treatment. In the event of a suspected outbreak, advice regarding management should be sought promptly from the medical centre or local public health authority.

**Easy-to-read signs in public areas of the centre notifying parents that sick children will be excluded from the centre.**

Excluding sick children is a method of limiting the spread of infection in the centre. The centre should have a written policy that clearly states the centre's exclusion criteria. Recommended minimum exclusion periods for infectious diseases can be found in the *Staying healthy in childcare - Preventing infectious diseases in early childhood education and care services*, 5th Edition, referred to above.

9 WHO (2011) Guide to ship sanitation 3rd Edition, <https://www.who.int/publications/i/item/9789241546690> accessed 4 January 2023.

# 03 Cleaning Equipment and Linen

## Assessment Criteria

- ✓ Premises free of unnecessary articles; cleaning equipment stored; only authorised personnel permitted.
- ✓ Clean and soiled linen in proper storage areas.
- ✓ Contaminated linens are appropriately separated and handled using appropriate personal protective equipment.

### Technical Inspection Notes

**Premises free of unnecessary articles; cleaning equipment stored; only authorised personnel permitted.**

Lockers, cabinets, or under sink shelves in as many areas as necessary should be provided.

Lockers or cupboards for housekeeping supplies should be labelled with words to the effect of “*CLEANING SUPPLIES ONLY*.” Cleaning solutions must be used according to the manufacturer’s instructions.

**Clean and soiled linen in proper storage areas.**

It is important that all clean linen is stored in the following manner:

- In a clean dry place that prevents contamination by aerosols, dust, moisture and pests.
- On clean shelves.
- Separate from used linen.
- In a manner that allows stock rotation.

Used linen should be stored in linen bags or suitable containers, which should not be overfilled and should be emptied when at or below capacity.

**Contaminated linens are appropriately separated and handled.**

Linens associated with cases of infectious disease, from both guests and crew in isolation, should be appropriately separated to ensure they do not contaminate other linens and to ensure crew appropriately handle these items. These items are recommended to be washed in a separate washing machine using higher temperature water.

Crew handling contaminated linen should be provided with and wear personal protective equipment.

# 04 Medical Facilities

## Assessment Criteria

- ✓ Evidence of sterilisation guidelines, which meet relevant Australian standards.
- ✓ Evidence of a policy for the management of blood spills.
- ✓ Evidence of an infection control policy.
- ✓ Evidence of an outbreak prevention and response plan.
- ✓ Vaccine storage in accordance with Australian vaccine storage guidelines.
- ✓ Body holding facilities must have an appropriate capacity and be secure.

### a) Medical Services

#### Technical Inspection Notes

##### **Evidence of sterilisation guidelines, which meet relevant Australian standards.**

Any reusable instrument or equipment used in an invasive procedure must be sterilised before and after use. All packaged and wrapped sterile instruments and equipment must be transported, stored and handled in a manner that maintains the integrity of packs and prevents contamination from any source. The manufacturer's instructions for effective and safe use of the steriliser must be followed. Documentation must be maintained for all reprocessing of reusable instruments and equipment and for the steriliser.

Autoclaves must be loaded correctly ensuring that any baskets or trays allow free passage of steam, minimise condensation on equipment and can be easily removed. Autoclaves should be fitted with physical monitors so these requirements can be checked.

Correct packaging equipment will permit aseptic removal from the steriliser and will ensure its sterility once removed from the steriliser. Equipment and packing material should be dry when removed from an autoclave. The packaging must still be intact at the end of processing to ensure the equipment is sterile.

An autoclave should be tested, serviced regularly and calibrated at least once a year by a qualified service technician. Biological indicators (bacterial spores) should be used to check the sterilising power of the unit. A number of calibrated bacterial spore tests are available commercially for this purpose.

Sterilisation depends on the following factors:

- temperature - the correct temperature shall be maintained for the specified time.
- cleanliness - the equipment must be clean to enable sterilisation.
- circulation - the chamber must be designed to allow steam to circulate around the equipment.

##### **Relevant Australian Standards for sterilisation**

- AS/NZS 4187: Cleaning, Disinfecting and Sterilising Reusable Medical and Surgical Instruments and Equipment, and Maintenance of Associated Environments in HealthCare Facilities.

- AS/NZS 4815: Office-based healthcare facilities. Reprocessing of reusable medical and surgical instruments and equipment, and maintenance of the associated environment.
- NSW Health, Health Procurement, Guidelines for Storage and Handling of Pre-Sterilised Consumables.
- AS 2487: Dry heat sterilisers.

### **Environmental Cleaning.**

Deposits of dust, soil and microbes on surfaces are a potential source of healthcare associated infection. The physical removal of micro-organisms and soil by wiping or scrubbing is probably as important as any antimicrobial effect of the cleaning agent.

Cleaning should be performed on a routine basis and should follow a logical order from clean to dirty. Frequently touched surfaces, including computer keyboards, handrails, telephones, doorknobs, tap handles and chairs in the patient waiting room, should be the focus of routine cleaning.

### **Evidence of a policy for the management of spills.**

Medical facilities must be kept clean, and vessels should have a written policy for the management of blood and body fluid spills. As an example, the NSW Health policy 'Cleaning of the healthcare environment'<sup>10</sup> recommends the following approach:

- Small spills (up to 10 cm) are wiped up with absorbent material (e.g., paper towels) and cleaned immediately or as soon as practical.
- Larger spills are first contained and confined with absorbent material, followed by removal of any broken glass or sharp material as required, and then cleaned as soon as practical.
- The use of disinfectants in the cleaning of blood or other body substances is to be based on an assessment of risk of transmission of infectious agents from the spill, which should be done in consultation with local infection prevention and control crew

### **Evidence of an Infection Control Policy.**

All healthcare facilities must have a written infection control policy to promote and facilitate the goal of infection prevention and control. Any infection control policy must cover standard precautions including hand hygiene, personal protective equipment, handling and disposal of sharps, environmental controls, reprocessing or sterilisation of reusable equipment, respiratory hygiene and cough etiquette, aseptic non-touch technique and appropriate waste handling.

### **Evidence of an Outbreak Prevention and Response Plan.**

Each vessel must have a documented outbreak prevention and response plan (OPRP). This plan will detail standard procedures to address an increase in cases of acute gastroenteritis and respiratory disease onboard. The written OPRP must include:

1. Duties and responsibilities of each department for all the passenger and crew public areas.
2. Steps in outbreak management and control and the trigger for required action at each step.
3. Disinfectant products or systems used, including the surfaces or items the disinfectants will be applied to, concentrations, and required contact times.
4. Procedures for informing passengers and crew members of the outbreak. This section should address the procedures for notification of passengers embarking the vessel following an outbreak voyage.
5. Procedures for returning the vessel to normal operating conditions after an outbreak.
6. Procedures to protect the passengers and crew from exposure to disinfectants.
7. Procedures for notifying the relevant health authority.

10 NSW Health (2020). Cleaning of the Healthcare Environment PD2020\_022, [https://www1.health.nsw.gov.au/pds/ActivePDS/Documents/PD2020\\_022.pdf](https://www1.health.nsw.gov.au/pds/ActivePDS/Documents/PD2020_022.pdf) accessed 4 January 2023.

### **Vaccine storage in accordance with Australian vaccine storage guidelines.**

Vaccines are fragile biological substances, and Australian public health authorities require storage at 2–8 degrees Celsius. Freezing may rapidly inactivate some vaccines, whilst warming may be associated with a decline in the vaccine's potency. Purpose-built vaccine refrigerators are recommended. The vaccine refrigerator requires daily monitoring and each day personnel should record the minimum and maximum temperatures, preferably on a specially designed form. Thermometers can be either built in or free standing and they must be capable of showing daily minimum and maximum temperatures, within +/- 1 degree accuracy. Thermometers should be digital and be able to be reset.

Written protocols are required to be developed and followed in the event of a breach in the cold chain.

The Department for Health and Aging *National Vaccine Storage Guidelines 'Strive for Five'*<sup>11</sup> checklist for vaccine storage consists of the following:

1. Reliable and stable refrigerator with adequate capacity.
2. Accurate and reliable temperature monitoring equipment.
3. Written processes for monitoring and recording temperatures.
4. Temperature probe is placed appropriately.
5. Education and information for everyone handling vaccines (ensure this includes new crew).
6. Maintenance schedule for temperature monitoring equipment, checking the accuracy of the thermometer and changing the batteries.
7. Written process for dealing properly with a cold chain breach (includes identification, response procedures, documentation and recording, prevention of occurrence).
8. Written process for ordering and rotating stock.
9. Written process for receiving vaccines.
10. Written process for managing power failure (e.g., having an alternative storage such as an esky with ice available).

## **b) Body Holding Facilities**

Cruise ships must have body holding facilities. Bodies should be placed into a secured bag in a way that prevents the leakage of any body exudate and the name of, or an identification of, the dead person clearly and indelibly written on the top outer surface of the bag. Refrigerated body facilities should be kept at a maximum of 5 degrees Celsius. This area must be secure with only designated personnel having access.

If a person has reason to believe that a body is infected with any of the following prescribed infectious diseases: avian influenza in humans, diphtheria, plague, respiratory anthrax, smallpox, tuberculosis, any viral haemorrhagic fever (including Lassa, Marburg, Ebola and Congo-Crimean fevers), the person must ensure that the bag or wrapping and any bag or wrapping used to replace that bag or wrapping, is clearly and indelibly marked with the words to the effect of "PRESCRIBED INFECTIOUS DISEASE – HANDLE WITH CARE".

11 Commonwealth of Australia 3rd Edition (2019) *Strive for five. National vaccine storage guidelines*, <https://www.health.gov.au/sites/default/files/documents/2020/04/national-vaccine-storage-guidelines-strive-for-5.pdf> accessed 4 January 2023.

# 05 Drinking Water

## Assessment Criteria

- ✓ Potable water halogenated to at least 2.0 mg/L free residual chlorine at the time of bunkering. Potable water tanks solidly constructed without leakage and without double bottoms and maintained.
- ✓ Potable water distribution system treated to provide a free halogen residual to at least 0.2mg/L free residual chlorine by means of a chlorination system installed according to manufacturer's instructions or specifications.
- ✓ Potable water system chlorine analyser and chart recording maintained, operated, and calibrated. Data loggers are permitted. Acceptable evidence of potability to be recorded in the vessel's logs.
- ✓ Potable water system not subjected to contamination through cross connections to non-potable water supply or through backflow or back siphonage. Evidence of a maintenance schedule to be included in the vessel's logs.
- ✓ Potable water filling hoses, caps, and connections maintained and stored. Sample cocks provided on tanks. Tank vents and sound tubes properly installed and maintained.
- ✓ Plumbing fixtures, supply lines, drain lines, and drains installed and maintained in good repair.

## Technical Inspection Notes

**Potable water chlorinated (measured as free residual chlorine) at the time of bunkering. Potable water tanks constructed and maintained.**

Water samples obtained from a sample cock between the bunkering disinfection and the storage tanks must have a free disinfection residual of at least 2.0 mg/L free residual chlorine and pH adjustment to ensure the pH does not exceed 7.8.

The WHO Guide to Ship Sanitation recommends WHO Guidelines for Drinking Water or relevant national standards, whichever are stricter. This requirement could be met with evidence that the water bunkered meets WHO Guidelines or relevant national standards, whichever is stricter. The WHO also recommends water safety plans for ships covering water management within ports, from receipt of water through to its transfer to the ship, complemented by water quality measures on board, provide a framework for water safety on ships. These records must be maintained on the vessel for 12 months and be available for review during inspections.

A free halogen residual and pH test must be conducted on the shore-side water supply before starting the potable water bunkering process to establish the correct halogen dosage. These tests must be recorded in the vessel's logs and available for review during inspections.

Double-bottom tanks are not suitable for storage of potable water on newly constructed ships and should be used only if absolutely necessary on existing ships. If double-bottom tanks are used to store potable water on existing ships, all access covers on top of such tanks, air relief vents, and overflows must be properly protected from bilge water or other contamination.

A distillation plant or other process that supplies water to the potable water system must not operate in harbour areas. However, a distillation plant or other process may be used to produce technical water while in polluted areas, harbours, at anchor, or while not making way.

The approved method of disinfecting bunkered water is continuous disinfection with an automatic hypochlorinator. Batch chlorination is acceptable in the following types of emergencies:

- (a) Equipment failure
- (b) Contaminated system
- (c) Plumbing or tank repairs

Lines carrying sewage or other non-potable liquids above or through potable water tanks are not permitted. Potable water lines under sewage or other tanks holding non-potable liquids are not permitted.

**The potable water distribution system is treated to provide a free halogen residual to at least 0.2mg/L free residual chlorine by means of a chlorination system.**

The vessel potable water distribution system must contain at least 0.2 mg/L free chlorine residual. The free chlorine residual must not exceed 5.0mg/L. This measurement shall be taken at a distant or far point in the distribution system from the point of disinfection..

The recommended method for disinfecting shipboard potable water is continuous disinfection with an automatic hypochlorinator that injects an amount proportional to water flow to maintain a free chlorine residual of at least 0.2 mg/L at all times throughout the vessel's potable water distribution system. This may be accomplished by means of a water meter to control the hypochlorinator or a free halogen analyser to control the amount of chlorine injected.

All water disinfection devices must be constructed and installed in accordance with manufacturer's instructions or in accordance with equivalent equipment standards recommended by manufacturers that conform to accepted engineering practice. The system must be capable of adding the amount of halogen required to maintain a free chlorine residual of at least 0.2 mg/L at a distant point in the distribution system. As a minimum, a backup pump must be available to replace the chlorinator pump on the distribution system if it should fail.

**Potable water system chlorine analyser and chart recorder maintained, operated, and calibrated. Acceptable evidence of potability.**

The ship must have a chlorine analyser-recorder that is installed in the potable water distribution system at a distant point where a significant water flow exists. The free disinfection residual measured by the analyser must compare within 0.2 mg/L (measured as free residual chlorine) of the actual halogen level.

The analyser and chart recorder must be properly maintained, operated and calibrated in accordance with the manufacturer's instructions. The daily manual comparison test or calibration must be recorded either on the recorder chart or in a log.

**Please note:** A review of records from the ship's automatic chlorine analyser must show that the ship has maintained adequate amounts of free halogen residual in the water distribution system since the last inspection of the vessel. The review will be deemed unacceptable if the records show a free halogen residual of less than 0.2 mg/L (measured as free residual chlorine) for more than 24 consecutive hours. Charts must be initialed and dated daily and retained for at least 12 months.

In the event of unexpected equipment failure, manual methods for disinfection and for determination of halogen residuals may be used temporarily provided that disinfection residuals are measured at least once every 8 hours. In such situations, ships must repair the malfunctioning equipment within 10 days.

Water samples may be collected during each periodic inspection and must be negative when analysed for



*Escherichia coli* bacteria and total coliform bacteria by a National Association of Testing Authorities (NATA)<sup>12</sup> accredited laboratory.

**Potable water system not subjected to contamination through cross connections to non-potable water supply or through backflow or back-siphonage.**

The following equipment, locations, conditions and concerns should be reviewed to determine the potential for contamination of the potable water system through cross-connections to non-potable water or through backflow or back-siphonage:

- (a) freshwater supply lines to swimming pools, whirlpools, hot tubs, bathtubs and similar facilities
- (b) photography laboratory developing machines and utility sinks
- (c) beauty/barber shop spray-rinse hoses
- (d) potable water taps where hoses are connected or are likely to be connected, including hoses to tanks containing chlorine and other chemicals
- (e) garbage grinders
- (f) dishwashing and glass-washing machines
- (g) hospital and laundry equipment
- (h) air conditioning supply tanks
- (i) boiler feed water tanks
- (j) fire system
- (k) priming of potable water, bilge, and sanitary pumps
- (l) freshwater or saltwater ballast systems
- (m) bilge or another wastewater
- (n) provision of air gaps between all potable and non-potable systems
- (o) lines to divert potable water to other systems by valves or interchangeable pipe fittings (only acceptable when an air gap follows a valve)
- (p) a common compressed air system that supplies pressure to both non-potable and potable water pneumatic tanks; the air supply must be through a press-on type of air valve or hose. A press-on valve is one that must be held in place manually. A fixed connection of this valve is only allowed when the air supply is on a separate compressor used exclusively for pressure to potable water pneumatic tanks
- (q) any freshwater supply connected to a vacuum toilet system that must be properly protected through the use of vacuum breakers. These vacuum breakers must be located on the discharge side of the last control valve (flushing device) and at least 150mm (6") above the flood-level rim of the fixtures. Individual vacuum breakers must be provided on all commodes or fixtures that use the vacuum system and which have submerged inlets.

A cross-connection control program must include a complete listing of cross-connections and the back flow prevention method or device for each, so there is a match to the plumbing system component and location. A log documenting the schedule of inspection and maintenance must be maintained and available for review.

Potable water suction lines must be installed to prevent contamination from bilges or other waste. When potable water is supplied under pressure, the system must be protected against backflow or other contamination by vacuum breakers, backflow prevention devices or air gaps between the delivery point of the water and the overflow rim of the unit.

Vacuum breakers or backflow prevention devices must be installed when air gaps are impractical or when water under pressure is required. Vacuum breakers, when used, must be installed in the supply lines on the discharge side of the last control valve at least 150mm (6") above the flood-level rim of the fixture to protect the potable water system from potential contamination.

Vacuum breakers and backflow prevention devices must be properly installed and maintained in good repair at all times to assure reliable operation. Air gaps must have at least twice the diameter of the delivery fixture opening. Backflow prevention devices are required instead of vacuum breaker when a shutoff is required after the connection. They must be functioning and under constant pressure.

<sup>12</sup> National Association of Testing Authorities (NATA), <https://nata.com.au/> accessed 4 January 2023.

When a cross-connection is discovered in the potable water distribution system, the potable water may be contaminated, and the entire system must be disinfected or all water flushed from the system in accordance with established procedures.

The piping of the potable water system, including the filling line, must be suitably stenciled, suitably painted either light blue or striped with 150mm (6") light blue bands or a light blue stripe, or other suitable colours as per the international standards (ISO 14726), at fittings on each side of partitions, decks and bulkheads and at intervals not to exceed 4.6m (15 feet) in all spaces, except where the decor would be marred by such markings.

All salt-water taps, except for fire hydrants, must be removed from the medical facilities. Only potable water is to be used for cleaning in these areas.

**Potable water filling hoses, caps and connections maintained and stored. Sample cocks provided on tanks. Tank vents and sound tubes properly installed and maintained.**

Potable water hoses must be flushed before the filling line is attached. Hoses must be drained after each use and stowed with end caps on reels or racks in special locker marked with words to the effect of "POTABLE WATER HOSE AND FITTINGS STORAGE" in letters at least 12mm (1/2"). Lockers must be closed, self-draining, smooth, non-toxic, corrosion-resistant, easily cleanable, fixed 0.5 m (18") above the deck, and used for no other purpose. Hoses and fittings must be maintained in good repair.

Potable water hoses must be handled with care to prevent contamination by dragging ends on the ground, pier, deck surfaces or by dropping the hose into the harbour. A hose that has become contaminated must be thoroughly flushed and disinfected. All fittings and other appurtenances used in connection with the loading of potable water must be handled and stored in a sanitary manner.

The potable water tank vent or combined vent and overflow must terminate with the open end pointed downward at least 0.5 m (18") above the deck, and it must be screened with No. 16 mesh or finer corrosion-resistant wire cloth to protect potable water from potential contamination.

Any device for determining the depth of water in the potable water tanks must be constructed and maintained so as to prevent contaminated substances or liquids from entering the tanks. The manual sounding of potable water tanks is discouraged and should only be performed when absolutely necessary.

The potable water filling line should begin either horizontally or in a gooseneck position pointing downwards, at a point at least 0.5 m (18") above the top of the tank or of the deck that the line penetrates. The filling line must have a screw cap or plug fastened by a chain to an adjacent bulkhead or surface in such a manner that the cap or plug will not touch the deck when hanging free.

Each filling line must be painted light blue or another suitable colour per the international standards, and clearly marked with words to the effect of "POTABLE WATER FILLING" in letters at least 12mm (1/2") high, stamped on a non-corrosive label plate or the equivalent and located at or near the point of hose connection.

Non-potable freshwater, if used, must be bunkered through separate piping using separate and different fittings. This water must flow through a completely different piping system and be identified with a different colour.

Sample cocks shall be installed on all potable water tanks. If this is impractical because of tank location or inaccessibility, access for sampling that tank must be provided. All access covers on top of potable water tanks, air relief vents, and overflows must be properly protected from bilges or other contamination.

**Plumbing fixtures, supply lines, drain lines and drains installed and maintained in good repair.**

Water supply lines and fixtures must be free from leaks and properly installed.

Wastewater from equipment and sinks must be properly drained to prevent pooling or leaking of water on the deck.

Individual air gaps must be placed in the drain lines from water bath sterilisers, hospital water stills, autoclaves and other hospital equipment that may be subject to sub-atmospheric pressure.

# 06 Legionella Control

## Assessment Criteria

- ✓ A current *Legionella* risk management plan in place to reduce the risk of Legionnaires' Disease.

### Risk Factors and Control Measures

Legionnaires' disease is a sometimes-life-threatening infection of the lungs (pneumonia) caused by bacteria of the *Legionella* family. Infection occurs when a person breathes in *Legionella* bacteria from an environmental source. It is not spread from person to person.

Ships are considered high-risk environments for the proliferation of *Legionella pneumophila* for several reasons including:<sup>13</sup>

- complex water storage and distribution systems that could provide greater opportunity for contamination.
- varying cold water temperatures, especially in tropical areas.
- long term storage and possible stagnation in pipes and shower heads.

*Legionella pneumophila* can grow to high numbers in warm stagnant water and can be aerosolised through showers and other plumbing fixtures. Many cases of Legionnaires' disease have been related to the use of spa pools and hot tubs.<sup>14</sup>

### Technical Inspection Notes

#### A current *Legionella* risk management plan in place to reduce the risk of Legionnaires' Disease.

The most important control measure is to have a thorough risk management plan for the control of *Legionella*. The plan must include details of periodic inspection and sampling if required of the water, maintenance of systems including the cleaning of shower heads, disinfection of systems, temperature controls and the use of preventative multiple barriers in all systems. The WHO Guidelines on *Legionella* and prevention of legionellosis can be used to prepare an appropriate plan.<sup>15</sup>

Control methods include:

- Maintaining temperatures either well above or well below levels that are optimum for *Legionella* growth.
- Maintaining biocides with reliable, well-designed and properly maintained dosing systems.
- Reducing the opportunity for aerosol generation and inhalation.
- Maintaining a routine cleaning schedule of shower heads, decorative fountains and water sprays to ensure they are free of algae and mould.
- Maintaining spa pools with suitable disinfection as per the *Public Health Regulation 2022*.<sup>16</sup>

13 WHO (2011) Guide to ship sanitation 3rd Edition, <https://www.who.int/publications/i/item/9789241546690> accessed 4 January 2023.

14 WHO (2001), Sanitation on Ships: Compendium, of outbreaks of foodborne and waterborne disease and Legionnaires' disease associated with ships (1970-2000), <https://apps.who.int/iris/handle/10665/67188> accessed 4 January 2023.

15 WHO (2007), *Legionella* and the prevention of legionellosis, <https://apps.who.int/iris/handle/10665/43233> accessed 4 January 2023.

16 NSW Government (2022), Public Health Regulation <https://legislation.nsw.gov.au/view/html/inforce/current/sl-2022-0502> accessed 20 March 2023.

As it is impractical to keep the temperature of water either well above or well below levels that are optimum for *Legionella* growth in spa pools and hot tubs, additional management measures are required. This includes complete draining and thorough cleaning of all surfaces and pipe works on a regular basis.

EHOs will request to inspect a copy of the *Legionella* risk management plan on all inspections. The *Legionella* risk management plan must identify actions to be taken in the event of *Legionella* detections or a case/cases of Legionnaires' disease associated with the vessel. Microbial water samples may be collected during routine inspections and will be tested at a National Association of Testing Authorities (NATA)<sup>17</sup> accredited laboratory and compared to Australian criteria.

17 National Association of Testing Authorities (NATA), <https://nata.com.au/> accessed 4 January 2023.

# 07 Recreational Water: Swimming Pools and Spa Pools

## Assessment Criteria

- ✓ **Swimming pools, spa pools and similar facilities maintained appropriately disinfected and operated as per the *Public Health Regulation 2022*.**
- ✓ **Chemical testing being undertaken using a photometric pool kit; chemical test kits onboard available and in good working order.**
- ✓ **Spa pools' temperatures limited to < 38 degrees Celsius at all times.**
- ✓ **Crew knowledge of chemical testing and action required following a chemical failure.**
- ✓ **Pool/spa logs kept on a regular basis and available for inspection.**

## Risk Factors and Control Measures

Infections can be transmitted in swimming pools and spa pools when pathogens are introduced into inadequately disinfected water by bathers. Infectious risk can be exacerbated where the water is unclean, warm, aerated, or with too much stabiliser or the pH is too high.

Spa pool folliculitis, also known as 'hot tub folliculitis' or 'pseudomonas folliculitis', is a skin condition that arises within hours to a few days after bathing in inadequately disinfected warm water, such as a spa pool or swimming pool. The result is an eruption of scattered small red itchy or tender bumps, some of which are pustular. They mainly occur in areas that were covered by the swimming costume. The condition may be associated with earache, sore throat, nausea and vomiting, headache and/or mild fever.

Contaminated public swimming pools have been associated with outbreaks of cryptosporidiosis worldwide.<sup>18</sup> *Cryptosporidium* oocysts can pass out in the faeces into pool water where they can survive for a long time as they are resistant to standard levels of bromine and chlorine.

Actions that can be taken to minimise the risk of faecal contamination in the pool include:

- Swimmers should be actively encouraged to shower prior to using the pool.
- People who have had a diarrhoeal illness in the previous 2 weeks should be advised to not swim in pool or spa.
- Non-toilet-trained infants should wear swimmers with waterproof tight-fitting pants over them or not be permitted to use the pool.

<sup>18</sup> NSW Health (2022) Guidelines for Public Swimming Pools and Spa Pools (DRAFT 2022), <https://www.health.nsw.gov.au/environment/water/Documents/NSW-guidelines-for-public-swimming-pools-and-spa-pools-draft-aug-2022.doc> accessed 4 January 2023.

**Please note:** All vessels with swimming or spa pools should have response plans for managing contamination by faecal, vomit and blood incidents, both within the water and on the surrounding surface. Examples of response plans in use in NSW can be found at the NSW Health website.<sup>19</sup>

## Technical Inspection Notes

### **Swimming pools, spa pools and similar facilities maintained appropriately disinfected and operated as per the *Public Health Regulation 2022*.**

Flow-through water supply systems for swimming pools must be used only at sea. Before arriving in port, the flow-through system must be shut off and a recirculating water supply system using only potable water shall be used with appropriate filtration and with adequate bromination or chlorination. Disinfection for a flow-through system converted to re-circulation must be initiated before the ship reaches port to achieve adequate levels of disinfection in the water. If this is not possible the pool must be drained before the ship reaches port and it must remain empty whilst in port.

Disinfection is a process which kills pathogens, but generally not their cyst forms. The aim of disinfection is to reduce the transmission of infections. It is not an instantaneous process but takes time. The higher the concentration of disinfectant the more rapidly killing of pathogens occurs. At the minimum recommended concentrations of chlorine and bromine, the kill time for common bacterial and viral pathogens is about one minute or less.

Most pathogens are easily controlled by disinfection but *Cryptosporidium* oocysts and *Giardia* cysts, which are types of spores, are resistant to disinfectants. Their transmission needs to be controlled by measures to prevent faecal contamination of the pool or spa and periodic super-chlorination/bromination or complete water change.

Disinfectant equal to or above the minimum concentrations identified in the *Public Health Regulation 2022 Schedule* <sup>120</sup> (see Tables 1 & 2) must be present in the pool water at all times. Disinfection must be provided by chlorine or bromine-based disinfectants. These disinfectants provide a readily measurable residual in the pool water. Each disinfectant has its advantages and disadvantages, and pool operators should consider any disinfectant or disinfectant system carefully before use.

Environmental health inspectors may collect and independently test recreational water samples.

Re-circulation and disinfection systems used with swimming pools and spa pools must be operated and maintained in good repair in accordance with the manufacturer's specifications, recommendations and standards. Filter pressure gauges and valves must be replaced when they are defective. Filters must be backwashed, and filter material must be changed periodically.

Private spa pools located in individual passenger cabins must be cleaned and disinfected, including associated recirculation systems, between occupancies or weekly, whichever is more frequent. Records should be kept and available for review during inspections.

#### **Disinfection Factors.**

- Increasing pH decreases disinfection power so that above pH 7.8, disinfection loses effectiveness
- Stabiliser (cyanurate) can be used in outdoor pools but should not exceed 50mg/L as disinfection becomes increasingly less effective and chlorine levels should be increased if stabiliser is used. Stabiliser is not suitable for use with bromination
- Pools should be equipped with a circulation system and filters capable of producing clean, clear water. Filtered water is easier to disinfect, reduces contaminants and produces less by-products. Circulation systems should be active whilst the pool or spa is open and for at least one hour before and after.

19 NSW Health: Public swimming pools and spa pools (Public), <https://www.health.nsw.gov.au/environment/water/Pages/public-pools-and-spas.aspx> accessed 4 January 2023.

20 NSW Government (2022), Public Health Regulation 2022 Schedule 1 <https://legislation.nsw.gov.au/view/html/inforce/current/sl-2022-0502#sch.1> accessed 20 March 2023

**Table 1: Chemical Requirements for Chlorinated Public Swimming Pools.<sup>21</sup>**

Parameter	Situation	Criteria <sup>1</sup>	
Free chlorine <sup>2</sup>	pH <7.6	Indoor pool	Min 2.0 mg/L
		Outdoor pool without cyanuric acid	Min 1.0 mg/L
		Outdoor pool with cyanuric acid	Min 3.0 mg/L
		Spa pool	Min 2.0 mg/L
	pH ≥ 7.6	Indoor pool	Min 3.0 mg/L
		Outdoor pool without cyanuric acid	Min 2.0 mg/L
		Outdoor pool with cyanuric acid	Min 4.0 mg/L
		Spa pool	Min 3.0 mg/L
Combined chlorine	Chlorine disinfected pool	Max 1.0 mg/L	
Total chlorine	Chlorine disinfected pool	Max 10.0 mg/L	
pH	Chlorine disinfected pool	7.0 – 7.8	
Total alkalinity	Chlorine disinfected pool	80 – 200 mg/L	
Cyanuric acid	Outdoor pool only	Max 50 mg/L, ideally < 30 mg/L	
Ozone <sup>3</sup>	Any pool	Not detectable	
Temperature	Any pool	Max 38°C	

1 mg/L is equivalent to parts per million or ppm.  
2 Free chlorine concentration should be increased when high bather numbers are anticipated to ensure concentrations are never less than the minimum.  
3 Residual excess ozone is to be quenched before circulated water is returned to the pool.

**Table 2: Chemical Requirements for Brominated Public Swimming Pools.<sup>22</sup>**

Parameter	Situation	Criteria <sup>1</sup>
Bromine <sup>2</sup>	Indoor swimming pool	Min 4.5 mg/L
	Outdoor public pool	Min 2.25 mg/L
	Spa pool	Min 4.5 mg/L
pH	Bromine disinfected pool	7.0 – 8.0
Bromide	Bromine bank system	Max 9.0 mg/L
Total alkalinity	Bromine disinfected pool	80 – 200 mg/L
Ozone <sup>3</sup>	Bromine disinfected pool	Not detectable
Temperature	Any pool	Max 38°C

1 mg/L is equivalent to parts per million or ppm.  
2 Bromine concentration should be increased when high bather numbers are anticipated to ensure concentrations are never less than the minimum.  
3 Residual excess ozone is to be quenched before circulated water is returned to the pool.

21 NSW Health (2022) Guidelines for Public Swimming Pools and Spa Pools (DRAFT 2022), <https://www.health.nsw.gov.au/environment/water/Documents/NSW-guidelines-for-public-swimming-pools-and-spa-pools-draft-aug-2022.doc> accessed 4 January 2023.

22 NSW Health (2022) Guidelines for Public Swimming Pools and Spa Pools (DRAFT 2022), <https://www.health.nsw.gov.au/environment/water/Documents/NSW-guidelines-for-public-swimming-pools-and-spa-pools-draft-aug-2022.doc> accessed 4 January 2023.

**Chemical testing being undertaken using a colorimetric pool kit; chemical test kits provided and in good working order.**

Chemical testing should be carried out using colorimetric technology and recorded every four hours. The pool kit should contain an operating manual and should be serviced in accordance with the manufacturer’s instructions. Immediate adjustments must be made where there are problems detected with the pool or spa disinfection. Test strips and 1-in-3 or 1-in-4 test kits are not suitable. Kits with plastic test tubes for testing for chlorine, bromine and pH are not suitable. Test kits should not be exposed to direct sunlight. Testing frequency shall be performed in accordance with Table 3. All test results shall be kept in a logbook, sheet, or as a database, and be readily available for immediate inspection by an environmental health officer.

**Table 3: Swimming pool and spa pool testing frequency.<sup>23</sup>**

	Test	Recommended Minimum Manual Testing Frequency
Non-automatic continuous dosing/metering	<ul style="list-style-type: none"> <li>Free chlorine/bromine</li> <li>Total/combined chlorine</li> </ul>	Prior to opening and thence every <b>two</b> hours (or every <b>one</b> hour when bather loads exceed design capacity)
	<ul style="list-style-type: none"> <li>pH</li> </ul>	Prior to opening thence as deemed necessary
Automatic control dosing	<ul style="list-style-type: none"> <li>Free chlorine/bromine</li> <li>Total/combined chlorine</li> <li>pH</li> </ul>	Once during the day to confirm automatic reading*
Other tests	Total alkalinity	Daily <b>OR</b> weekly if using liquid chlorine disinfection or carbon dioxide (CO <sub>2</sub> ) pH control
For all pools and spa pools	Additional testing should be undertaken when necessary, taking into account the number of people swimming in the pool at a particular time, the hours of operation of the pool, the depth of the pool and the effect of sunlight on disinfection levels.	
* provided that the in-line automated dosing system is checked and logged hourly)		

**Spa Pools temperatures limited to < 38 degrees Celsius at all times.**

Spa pools also include whirlpools, whirlpool spas, heated spas, hot tubs or jacuzzis. Where spa pools are heated the temperature must never exceed 38 degrees Celsius. Warmer temperatures favor bacterial growth such as *Legionella* in filter media, which may be transmitted by aerosols in spa pools. *Pseudomonas aeruginosa* survival and growth is enhanced at pool temperatures exceeding 26 degrees Celsius. In addition, bathing in waters warmer than 38°C for longer than 20 minutes may cause heat illness. Parents of children under the age of 6 years, persons with medical conditions and pregnant women should seek medical advice before using a heated spa pool. A sign must be displayed at each spa pool entrance listing precautions and risks associated with the use of these facilities.

Spa pools must have suitable anti-entrapment drain covers.

**Crew knowledge of chemical testing and action required following a chemical failure.**

Chemical testing is an important method to ensure the quality of the water and therefore the crew member responsible for the testing must have either qualifications or experience to undertake work. Officers will always assess this person’s knowledge during an inspection.

**Pool/spa logs kept on a daily basis and available for inspection.**

A log sheet or register should be used to record the results of every test performed at a swimming pool, spa pool or pool complex. The keeping of records can be used to demonstrate competency in pool operations. Logbooks containing all of the log sheets should be maintained in a register for assessment of any technical issues and problems that may arise.

<sup>23</sup> NSW Health (2022) Guidelines for Public Swimming Pools and Spa Pools (DRAFT 2022), <https://www.health.nsw.gov.au/environment/water/Documents/NSW-guidelines-for-public-swimming-pools-and-spa-pools-draft-aug-2022.doc> accessed 4 January 2023.



Where automated in-line tests are recorded electronically, these should be downloaded at minimum monthly and kept with any other records. One position should be responsible for the routine pool testing and recording of results each working shift and the records in the log sheet should indicate the responsible person.

Logs and charts must be retained for 12 months and must be available for review during inspections.

A sample log sheet in use in NSW is available on the public swimming pool and spa pool webpage.<sup>24</sup>

A rescue or shepherd's hook and an approved flotation device should be provided at a prominent location.

<sup>24</sup> Public swimming pools and spa pools <https://www.health.nsw.gov.au/environment/water/Pages/public-pools-and-spas.aspx> accessed 2 June 2023.

# 08 Skin Penetration - Beauty Therapy and Associated Facilities

## Assessment Criteria

- ✓ Crew have ready access to hand washing facilities.
- ✓ Environment, equipment and utensils clean.
- ✓ Single use of needles and correct disposal of sharps.
- ✓ All items used to penetrate the skin are single use or sterilised after use.
- ✓ Proper storage and handling of clean/soiled equipment and utensils.
- ✓ Prevent cross contamination of products applied to the skin.

### Risk Factors and Control Measures

Skin penetration procedures undertaken on cruise ships include acupuncture, waxing, manicures and pedicures (involving the cutting of cuticles). When procedures involving penetration of the skin are not managed correctly, there is the possibility that they can transmit infections to clients. The risk of transmitting an infection can be minimised by ensuring that infection control techniques, which include aseptic procedures, are practised correctly and that effective sterilisation of equipment occurs. It is also paramount that the premises are maintained in a hygienic manner. Crew should wear single use gloves for all skin penetration procedures.

On many vessels the beauty spa is managed by an external contractor. Inspectors will in the first instance direct any matters that arise from the inspection to the Captain.

### Technical Inspection Notes

#### Hand washing facilities

A hand wash basin with hot and cold running water, soap, single use paper towels and a waste receptacle should be available in close proximity to where the procedure is being undertaken.

#### Environment, equipment and utensils clean.

The procedure area must be maintained in a clean and hygienic condition. Detergent should be used for general cleaning. The concentration of the chemical for each application should be documented in the cleaning schedule.

#### Single use of needles and correct disposal of sharps.

All needles are to be single use and disposed of immediately following the procedure to limit the risk of needle stick injuries. All used sharps are to be placed into a clearly labelled, puncture resistant sharps container which must be kept as close as possible to the area where the sharps are used. Sharps containers must be placed in a location where clients cannot access them. For example, containers should not be placed on floors, or on the lower shelves of trolleys in areas where children might gain access. Sharps containers should not be permitted to get filled beyond the fill point or to a point where products are not completely

enclosed in the container. Records should be able to be produced for the suitable disposal of sharps from the beauty spa.<sup>25</sup> Disposable razors, used at the ship's barber/hairdressers must be disposed of into a sharps container.

**Proper storage and handling of clean/soiled equipment and utensils.**

All reusable equipment which penetrates the skin (e.g. cuticle cutters) must be washed with warm soapy water and then sterilised between clients. Sterilisation should be undertaken using an approved benchtop steriliser.

All towels used for clients should be clean and changed between clients. Following cleaning towels and other linen should be stored in a manner to limit the risk of contamination.

All equipment used by hairdressers including combs, brushes, rollers, streaking caps, clippers, and scissors, should be cleaned between uses. It is not recommended to use manual clippers with non-detachable blades as they cannot be easily cleaned. Equipment should not be soaked in disinfectant unless specified by the manufacturer's instructions. Cleaning the equipment in warm water and detergent and allowing it to air dry should be sufficient.

**Foot spa maintenance:<sup>26</sup>**

Foot spas need to be cleaned thoroughly to prevent the growth and spread of disease-causing micro-organisms. The foot spa should be cleaned and disinfected between each client and at the end of the day according to the following directions:

After each client:

- Drain the water from the foot spa.
- Clean the surfaces of the foot spa with a suitable cleaning agent, warm or hot water and cloth and/or scrubbing brush, then rinse.
- Disinfect by spraying the foot spa with a hospital grade disinfectant
- Re-circulating 'air-jet' spas need to be disinfected by circulating clean water and disinfectant according to the manufacturer's instructions.
- After disinfection allow to air dry or wipe the foot spa until dry using a clean lint free cloth.

At the end of the day:

- Remove the foot spa components (inlet jets, filter screen) using gloves and thoroughly scrub the foot spa and components with a brush, warm or hot water and a suitable cleaning agent.
- Immerse the screen in a hospital grade disinfectant solution or a 10% bleach solution (1 part bleach to 9 parts water) for at least 10 minutes.
- Rinse the foot spa and components with clean water and re-assemble.
- Re-fill with clean water and disinfectant - for re-circulating 'air-jet' spas the disinfectant solution must be circulating for the required contact time, or for at least 10 minutes. A long contact time is more likely to kill bacteria and other disease-causing microorganisms.
- After disinfecting drain, rinse and air dry.
- Store the foot spa in a clean, dry and dust free environment.

Records of the cleaning of the foot spa, including the use of chemicals and the contact time required to carry out the cleaning process should be made available for review at the time of the inspection.

**Prevent cross contamination of products applied to the skin.**

Lubricants, creams or gels must be dispensed into separate containers at the start of each procedure. Wax must be single use only and disposed of immediately after use

25 NSW Health (2017) Infection Prevention and Control Policy, [https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2017\\_013.pdf](https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2017_013.pdf) accessed 4 January 2023.

26 NSW Health (2022) Cleaning and disinfection of foot spas, <http://www.health.nsw.gov.au/environment/factsheets/Pages/foot-spa.aspx> accessed 4 January 2023.

# 09 Pest Control

## Assessment Criteria

- ✓ **No presence of insects and rodents; outer openings protected; approved pesticide application.**
- ✓ **Integrated pest management plan.**
- ✓ **Toxic items stored, labelled, and used properly.**

### Risk Factors and Control Measures

Ports receive and manage goods and people from all over the world, increasing the risk of introducing vectors from any part of their host country or any other port in the world. Ships' crews should be given adequate training in the safe handling and storage of chemicals, spill management techniques and personal protective equipment. Further, the crew should be provided with personal protective equipment.

### Technical Inspection Notes

#### **No presence of insects and rodents; outer openings protected; approved pesticide application.**

Spaces where food and drink are stored, handled, prepared, or served must be maintained to prevent rodent and insect infestation. Non-toxic glue traps and bait stations may be located in food storage and preparation areas, but they must be located so as not to contaminate food and must be checked and changed frequently.

Any high-toxicity pesticide applications should be under the direction of a licensed pest control operator. Pesticide application is prohibited in food preparation or storage areas when food is being prepared or is exposed. Application is prohibited to crockery, cutlery and food preparation equipment and cupboards.

#### **Integrated pest management plan.**

Vessels must be able to produce a tailored integrated pest management plan that documents the use of pesticides, insecticides and other means undertaken to eliminate the presence of pests and rodents.

The integrated pest management plan must set a schedule for periodic active monitoring inspections, including some at night or during periods of no or minimal activity. The integrated pest management plan, monitoring records, and other documentation must be available for review during inspections.

#### **Toxic items stored, labelled, and used properly.**

Toxic items should be stored and used in accordance with the Australian Maritime Safety Authority Code of Safe Working Practice for Australian Seafarers<sup>27</sup>, in particular;

Toxic and other hazardous substances and products should be used and stored in such a way that users and others are safeguarded against accidents, injuries or discomfort. The ship should keep a register of hazardous substances on board.

<sup>27</sup> Commonwealth of Australia Australian Maritime Safety Authority (1999). The code of safe working practice for Australian seafarers, <http://www.coxswaintraining.com.au/spwcodetoc.pdf> accessed 4 January 2023.

Safety data sheets (SDS) containing sufficient information to determine the degree of the danger posed by the substances should be readily accessible to all users. The SDS should be consulted for accidents involving chemicals. All persons required to use hazardous substances need to be trained in safe use, including the use and maintenance of personal protective equipment.

Chemicals should always be handled with extreme care; protection should be worn, and the manufacturer's instructions closely followed. Provision of an adequate supply of suitable personal protective equipment should be available on the vessel.

The substances should be stored in the original packaging or in another correspondingly labelled packaging that cannot give rise to confusion. Such substances must be stored in a locked, well-ventilated room.

# 10 Disposal of Waste

## Assessment Criteria

- ✓ **There is a current waste management plan.**
- ✓ **Clinical waste stored in appropriate yellow or red bags and not overfilled. Sharps are stored in approved sharps containers.**
- ✓ **Putrescible waste stored in tightly covered bins.**
- ✓ **The waste storage area is not accessible to the public and has rigid impervious flooring. Clean up facilities, spill kits, appropriate drainage and bunding provided.**

### Technical Inspection Notes

Unsafe management and disposal of ship's waste can readily lead to adverse health consequences. Waste streams on ships include black water, grey water, garbage, ballast water, effluent from oil/waste separators, cooling water, boiler and steam generator blow down, medical waste, industrial wastewater and hazardous waste.<sup>28</sup>

In NSW, the Environment Protection Authority (EPA) provides classification of waste.<sup>29</sup> Classifying waste into groups that pose similar risks to the environment and human health facilitates their management and appropriate disposal. Wastes can be classified into special waste (including clinical waste), liquid waste, hazardous waste, restricted solid waste, and general solid waste (putrescible and non-putrescible). The environmental health inspection includes disposal of general solid and clinical waste.

#### Waste management plan.

Vessels must be able to produce a tailored waste management plan that covers clinical, hazardous, liquid and solid waste. There should be a specific management plan for food preparation areas. Consideration should be given to how waste is transported around the ship to minimise incidental exposure and contamination of the environment.

#### Clinical and sharps waste.

Clinical and related waste refers to:

- Clinical waste – any waste resulting from medical, nursing, dental, pharmaceutical, skin penetration or other related activity including human tissue, bulk body fluids or blood, materials or equipment visibly stained by body fluids, and laboratory specimens or cultures.
- Pharmaceutical – waste that consists of pharmaceutical or other chemical substances and includes expired or discarded pharmaceuticals.
- Sharps waste – any waste collected from designated sharps waste containers and refers to needles, syringes or surgical instruments and items that are designed for the purpose of cutting, piercing or penetrating the skin and that have the potential to cause injury or infection.
- Chemical waste – includes mercury, cyanide, azide and formalin.

28 WHO (2011) Guide to ship sanitation 3rd Edition, <https://www.who.int/publications/i/item/9789241546690> accessed 4 January 2023.

29 NSW EPA, Classification of waste, <http://www.epa.nsw.gov.au/resources/wasteregulation/140796-classify-waste.pdf> accessed 4 January 2023.

Clinical waste should be stored in appropriate yellow or red bags and should not be overfilled. Sharps should be collected in approved sharps containers and retained on board for disposal on shore. Crew handling clinical waste should wear appropriate personal protective equipment.

Healthcare waste that is not sharps waste or visibly contaminated by body fluids may be disposed as general waste.

**Putrescible waste.**

Putrescible waste includes disposable nappies, incontinence pads, sanitary napkins and food waste.

Putrescible waste can be stored in tightly covered bins, or in closed compartments protected against the weather and the entry of rodents, flies and cockroaches. Crew should ensure that when transporting putrescible waste that the bags are tightly closed so as to not drip liquid waste on the floor.

**Waste storage area.**

Waste storage areas or garbage rooms must not be accessible to the public, have a lockable door and rigid impervious flooring.

Clean up facilities, spill kits, appropriate drainage and bunding should be provided. Solid waste should be stored in tightly covered bins, or in closed compartments. The containers should be thoroughly cleaned after emptying to discourage harbourage of rodents and pests.

Waste storage areas should be designed so waste containers are stored up off the floor with clearance to allow for pest control and ease of cleaning.

The waste storage area must be constructed of easily cleanable, impervious, washable materials, and should be large enough to store and process garbage and refuse. Floors must be kept clean at all times. A sink for cleaning equipment should be provided with hot and cold running water. Cleaning equipment should be maintained in good condition or replaced as needed.

There should also be a hand washing basin with hot and cold running water, soap and single use hand towels available in close proximity.

The waste storage area should be mechanically ventilated to the outdoors to minimise odour. The room should not harbour pests or rodents.

# Appendix A: Equipment List

For inspections of vessels several pieces of equipment are required including:

- iPad or suitable equipment for completing the iAuditor inspection report or alternatively a paper based form with a pen and clip board
- mobile phone to capture photos of inspection and areas of concern
- Palintest or alternative swimming pool test kit including reagents for (at a minimum):
  - Free Chlorine
  - Total Chlorine
  - Bromine
  - pH
  - Alkalinity.
- Suitable identification, including both your physical drivers license (or other personal identification) and your work place identification
- Appropriate attire:
  - Covered shoes, appropriate for walking
  - Long pants
  - Long sleeves
  - Hat and sunglasses for outside activities including swimming pool inspections.
- Sunscreen, should also be worn, but additional should be brought to re-apply during the day
- Water bottle
- Business cards
- Additional pens and paper
- High visibility safety vest.



